

09/937,208

~~converted to volumes of hydrogen ( $\mu$ liters) and then adjusted for the differences in calibration volume (0.5 liters, as discussed above) and sample volume 18 of the sensor assembly 20 by multiplying the volume of hydrogen by the ratio of the sensor volume 18 to that of the calibration volume. Figure 4 illustrates the close correlation between the expected theoretical diffusible hydrogen concentrations and the diffusible hydrogen concentrations measured during use of the sensor assembly 20.~~

BSH 8/17/07

Please amend the paragraph beginning on line ~~6~~<sup>19</sup> and ending on line ~~19~~<sup>29</sup> of page 15 of the Specification as follows:

~~This adjusted volume was then plotted (not shown) as a function of sensor response, i.e., signal drop, to correlate the volume of diffusible hydrogen to the signal drop detected in the sensor 28, a curve with a slope with units of  $\mu$  liter/nW. Significantly, the slope of this curve provides a standard conversion factor that can be applied to each sensor assembly response curve to determine a rate of diffusivity from the weld material, i.e., in units of  $\mu$  liter/minute, which, in turn, can be used to determine the initial diffusible hydrogen concentration in a weld sample by multiplying by the time since the initial weld process was completed. As can be appreciated, the present invention is useful for quickly determining a concentration-response curve slope from concentrations of diffusible hydrogen evolving from a welded surface into the sample volume that is indicative of hydrogen diffusivity rate, correlating this measured hydrogen concentration to a volume of hydrogen per quantity of weld material, and then relating the quantified hydrogen concentration such slope back to the initial diffusible hydrogen concentration existing in the weld material immediately after weld completion according to the slopes of curves generated experimentally and/or theoretically, which, as explained above, correlated closely with initial diffusible hydrogen concentrations in duplicate welds, i.e., welds made with the same kinds of materials in the same conditions.~~

Please amend the paragraph beginning on line 6 and ending on line 19 of page 19 of the Specification as follows: